# Chapter 0. INTRODUCTION

We consider a finite well-ordered system of observers, where each observer sees the real numbers as the set of all infinite decimal fractions. The observers are ordered by their level of "thickness", i.e. each observer has a thickness number (hence we have the regular integer ordering), such that an observer with thickness $k$ sees that an observer with thickness $n < k$ sees and deals (to be defined in Chapter 1) not with an infinite set of infinite decimal fractions, but actually with a finite set of finite decimal fractions. Let us call this set $W_n$, i.e. it is the set of all decimal fractions, such that there are not more than $n$ digits in the integer part and $n$ digits in the decimal part of the fraction. Visually, an element in $W_n$ looks like $\underbrace{\_\ \ldots\ \_}_{n}.\underbrace{\_\ \ldots\ \_}_{n}$.

Moreover, an observer with a given thickness is unaware (or can only assume the existence) of observers with larger thickness values and for his purposes, he deals with "infinity". These observers will be called *naïve*, with the observer with lowest thickness number – the most naïve. However, if there is an observer with a higher thickness number, he sees that a given observer actually deals with a finite set of finite decimal fractions, and so on. Therefore, if we fix an observer, then this observer sees the sets $W_{n_1},\ldots,W_{n_k}$ with $n_1 < \ldots < n_k$ indicating the thickness level, and realizes that the corresponding observers see and deal with infinity. When we talk about observers, we shall always have some fixed observer (called us) who oversees all others and realizes that they are naïve. The "$W_n$-observer" is the abbreviation for somebody who *deals* with $W_n$ while thinking that he deals with infinity.